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The Chief Engineer

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Henry Abbott

The Chief Engineer

By
HENRY ABBOTT

NEW YORK
1920

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The Chief Engineer

by

Henry Abbott

IT was a dark night in July—very dark. There was no moon and clouds hid the stars. We were sitting by the camp fire. Bige had just kicked the burning logs together so that a shower of sparks shot straight up toward the tree-tops, indicating that there was no wind, when he said, "If you want to make that picture of deer this is just the kind of a night to go for it. You must have it dark so you can get close enough to get a good photograph. Also, this is just the kind of weather when we are likely to find deer feeding near the mouth of the river."

So with camera and flash-light apparatus I climbed into the bow end of our light-weight cedar boat, while Bige with paddle sat in the stern. We aimed toward the mouth of the river about half of a mile from camp and across

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The Chief Engineer

the pond. No land-marks were visible, so we steered by "dead reckoning." Bige was feathering his paddle, Indian fashion without lifting it out of the water, so we silently proceeded, making no ripple on the surface and yet, at first, rather swiftly.

A few minutes later, the bow of the boat struck some yielding obstacle. My first thought was that we had hit a mossy, overhanging bank on the opposite shore of the pond. In times of stress, thoughts follow each other in rapid succession. My second thought was that the opposite shore was not mossy and overhanging, but rocky; third, that we had not been out long enough to get across; and fourth that we must have hit some animal who was swimming. But things were happening now, more rapidly than thoughts, and very much quicker than the time required to tell about them; and this latter thought was confirmed long before it was completely formulated.

Instantly, after we struck, a violent commotion occurred under the bow of the boat, water splashed in my face, there was the sound of scratching, gnawing and splintering wood, then a paw appeared on the gunwale beside me, the boat rocked and I yelled to Bige, "He is climbing aboard!!" while I lifted the camera intending to brain this indistinct shape as soon as I could see its head. This was immediately followed by the release of the weight on the side of the boat, its rocking in the opposite direction, a resounding slap on the water which threw a shower of spray over my head, in my eyes and ears. Then silence.

"Must have hit a muskrat," said Bige.

"More like a collie dog or a young bear," said I. "He surely would have swamped the boat if you had not slapped the water with the paddle, and I would have smashed my camera over his head."

"I didn't slap anything with the pad-

A Beaver Fountain

dle. I wouldn't spoil your fun that way. Your friend in the water made all the noise. Wonder what he was," said Bige.

"Well, it was no measly muskrat, I'll stake my reputation and experience on that," said I.

There ended our photographing operations for that occasion, since after such a racket no deer could be expected to show himself at the pond, so we turned back to camp. On the way we discussed the possible identity of the animal with whom we had just been in collision, and who had upset our plans for the evening.

Most wild animals swim; some for pleasure, others only when it cannot be avoided. In the darkness we failed to get a clear idea of the size or shape of this fellow, we could only judge by the jolt our boat got, and the commotion he made in the water. We canvassed the possibility of its being a coon, a fox, an otter, a porcupine, a marten, a lynx or

a wolf; but there was something about the habits of each that would not fit the incident and we went to bed with the problem still unsolved.

After breakfast the following morning, we went down to the shore and examined our boat. The thin part of the prow above the water line had been bitten through and a splinter a half-inch thick and eight inches long had been torn out. The marks of very sharp clean cutting teeth plainly showed at the upper end of the break. Short brown hairs were sticking to the rough edges of the bow, and on the keel for a space of eighteen inches back of the bow.

"That fellow must have thought a tree fell on him," said Bige. The boat, we found did not leak, so we went fishing. Passing a small island about a mile up the pond, we noticed a young green poplar tree had fallen into the water. There had been no wind storm for months and we did not know of any

other campers on the pond so we wondered who could have cut down that poplar, and why? We went ashore to investigate. The tree we found was about four inches in diameter at the butt and it had not been chopped, but had been gnawed off. The ground about the stump was strewn with chips and one branch had been gnawed off and carried away. The tooth marks on the stump were like those on the bow of our boat, and looked as if made by a curved chisel about a quarter inch wide. The chips were from two to four inches long and were clean cut on each end and split out as if they had come from a wood chopper's axe.

Bige said, "Gosh! that looks like the work of beaver, but there are no beaver in these woods, haven't been any here for sixty years."

A few minutes later we found the branch which had been cut from the fallen poplar floating on the water near shore opposite the island. The bark

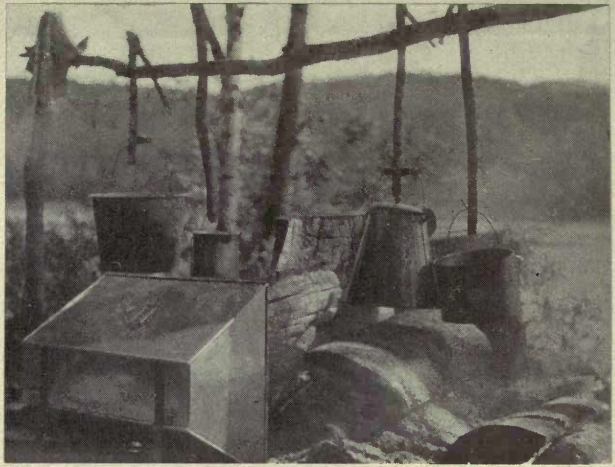
had been stripped from it down to the smallest twig and it appeared white and conspicuous when seen from a distance of fifty yards.

Proceeding on our way toward the fishing ground, we presently saw the head of some animal above the surface. It was swimming toward us and waves were spreading out fan wise in its wake, on the smooth surface of the pond. Instantly we became motionless and watched its approach. When within fifteen or twenty yards of our boat it stopped, eyeing us curiously, then swung to the right and again to the left, apparently for the purpose of viewing us from different angles. Its back appearing above the surface was covered with a reddish brown fur with long grey hairs showing at intervals. There was a large white spot on the top of his head (this we later learned was not a characteristic marking, a white spot being quite unusual on animals of this family, and it enabled us to recognize our first

acquaintance from among the many members of his tribe whom we subsequently met.) Two large, projecting and curving cutting teeth on the upper and two on the lower jaw appeared when he opened his mouth. There were also eight molars on each jaw. His eyes were inconspicuous and his ears were small but he had a broad, flat tail, shaped somewhat like the blade of a paddle.

Having, apparently, decided that it would be unwise to cultivate a closer acquaintance with two men in a boat, our swimmer humped his back, lifted high his broad tail and with it struck the water a powerful slap, the noise of which reverberated from "Mud Pond Mountain to East Inlet Holler" and it threw a shower of water and spray eight or ten feet into the air, looking like some of the war pictures of exploding mines.

The animal disappeared under water but a long line of air bubbles coming to the surface marked his progress under



Camp Fireplace

water. These we followed about two hundred yards to where they ended at the opposite shore. A closer examination disclosed the entrance, about two feet under the surface, of a burrow which seemed to rise under the high bank.

"Well," said Bige, "that's the fellow who met up with our boat last night. He's a beaver all right, but where in tunket did he come from?"

The incidents here related occurred while we were camping at Cherry Pond, seventeen years ago. We had learned in many conversations with Mitchell Sabattis (an Indian who died at a very advanced age a few years ago, and who was the oldest inhabitant of this region), about the Indians trapping beaver here, and how they sold hundreds of skins to John Jacob Astor, who became rich dealing in furs which he purchased throughout the northern forests and in Canada.

Sabattis explained that it was the practice of the Indians to take only

a few animals from each colony, when they would move their traps to another dam. Thus there were always enough beaver left for breeding and they increased rapidly. But the white trappers, when they came, caught every beaver and took every skin, big and little, with the result that in a few years' time, beaver had been exterminated from the Adirondack forests and none ever came in again.

A few days after our encounter with the animal as above related, we learned, while making inquiries, that during the previous season the Conservation Commission of the State had "planted" a family of six beavers on one of the streams emptying into Raquette Lake, and we concluded that the individual we met was an emigrant from that colony.

Upon studying the government map, we figured that if he followed a chain of lakes and ponds through the connecting streams, he must have traveled thirty-

five miles. If he had come over the mountain and several foothills in a straight line, which seemed unlikely, he might have shortened his trip to about twenty miles.

We saw the white headed beaver many times during our visits to the pond that summer, sometimes on shore, or sitting on the trunk of a poplar or birch tree which he had felled near the water. His body was about thirty inches long, tail ten inches long and six inches wide, hind feet webbed, like those of a goose, fore feet resembled the hands of a child but with long, sharp toe nails. He might have weighed forty or fifty pounds. He was a slow and clumsy traveler on land but a very efficient citizen in the water. He could dive and remain under water from eight to ten minutes without apparent inconvenience. Swimming, he could tow a log twice his own weight and against the current when necessary.

Early in September, his wife arrived. Whether the "old man" went after her,

whether he sent a wireless message or a telepathic command, or whether the date of her coming had been arranged between them before he left home, we never knew. It seems quite probable that she just naturally knew that it was high time for her husband to stop exploring and loafing and to get busy building a house and storing a supply of food for the winter, so she arrived.

She would have no difficulty in following his trail, which after the habit of his kind, he doubtless marked at more or less frequent intervals by scooping up from the bottom of the pond or stream a double handful of soft mud, which he would place on the shore, shape it up into a nice round mudpie and deposit in its center a few drops of "Castoreum." This material has a peculiar, pungent and individual odor easily recongized by members of a beaver family. The Indians also highly prized the castoreum of the beaver for its supposed medicinal properties.

Immediately on the arrival of the female beaver the two began work building a house. This was placed on a point of land between the mouth of the river and a shallow bay or slough. The base of the house was about a foot above the normal level of the pond. Straight sticks and crooked branches two to four inches in diameter and about five feet long were placed on the ground for a foundation and were arranged in a circle like the spokes of a wheel. On these were piled other sticks, brush, stones, sod and mud, which latter was used as cement or mortar to bind the other materials together. An open space was left in the center, which grew smaller in diameter as the walls were carried up and was finally arched over. The house when finished was fourteen feet in diameter at the base; it was cone shaped and six feet high. It had no door or entrance visible on the surface; but as the side walls were being carried up one of the beavers dug a round hole

Beaver House

twelve inches in diameter, straight down from the center of the house about eighteen inches, when it was curved toward the river and opened out in the bottom. Then he dug a second entrance, close to the first one, but this curved toward the slough. The water there being shallow, a ditch or canal dug in the bottom carried the outer end of the burrow down about three feet below the surface and a hundred feet or more out to deep water. The mud procured in digging the entrance and exit was used in plastering the walls of the house. No mud was used on the ventilating flue, which was a space about a foot in diameter in the center of the cone. This was thoroughly protected from outside enemies by two feet in thickness of criss-crossed sticks, but air could freely pass through the interstices.

The house building proceeded rapidly, much of the work being done at night, but we were able to inspect the building daily, and several times we found the

beavers working in the daytime. Always the white crowned beaver was the leader and seemed to be directing the work of the other. When the structure was completed it proved to be an excellent example of reinforced concrete work of a most substantial character. Nevertheless, six weeks later, just before freezing weather started, a final coating of mud three inches thick was plastered over the entire outside surface of the house. When frozen, this armor plate would furnish complete protection to the furry inhabitants against their most ferocious enemies during the long and hungry months of winter.

Some years later, a beaver house, the side of which had been cut away, afforded an opportunity for us to learn how our white-headed friend finished the inside of his castle. The rough projecting inner ends of sticks, branches and brush were gnawed off making a roomy, smooth-walled, dome ceilinged space divided into two parts. The

first, or ground floor, contained the openings for entrance and exit. It also was used as a drying room; for no self-respecting beaver would ever permit himself, his family or guests to go to bed in wet clothes. Coming in from swimming in the pond or river he must sit in the vestibule until his wet fur is thoroughly dry before he climbs into the bunk.

The drying floor also serves the purpose of a dining room in winter, when the pond is covered with ice, as will later appear.

The sleeping apartment had its floor about six inches higher than the drying floor. The bed was made of thin shreds or splinters of dry poplar wood. A quantity of this material had been split out with an expenditure of much time and patience. A mattress three inches or more thick, made of this soft, elastic material would make a far better bed than many campers can boast of.

Mud for use in house building was

procured, not only from the tunnel entrances and from the canal, but excavations were made in the river bottom near the house. A pocket was there dug out, about twenty feet in diameter, making the water six feet deep.

Into this hole the two beavers now proceeded to store their food for the winter. This consisted chiefly of the trunks of poplar saplings, two to six inches in diameter, cut into lengths of four to six feet, the sticks of larger diameter being the shorter. In the wood pile were also placed the branches of the same trees. Mixed in with the poplar were some alders and a few birch and soft maple sticks. The birch and alder apparently were used to add spice and tang to the otherwise sameness of their more staple food.

In the edge of the forest next the slough a few years before, a fire (doubtless started by some careless hunter), had burned over several acres, and this was now covered by a "second growth"

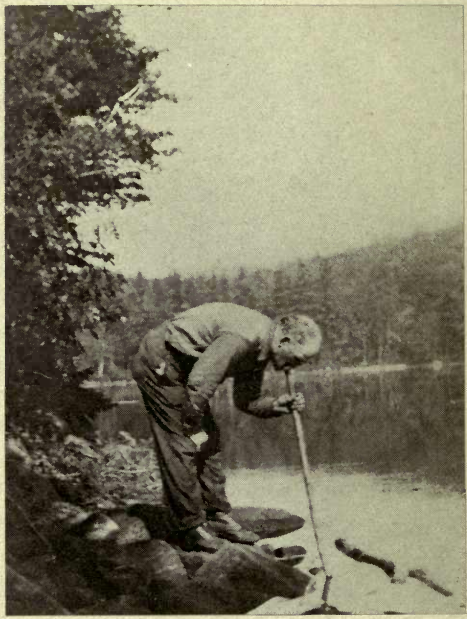
of poplar. It was there that the beavers cut most of their lumber. The water in the slough was shallow and filled with pond lillies, so a canal three feet wide, two feet deep and two hundred and twenty feet long was dug across this mudhole. Through this canal the beavers floated their sticks and brush and placed them on their storage pile under water so that the bark, which they eat, might be kept soft and fresh for winter use. Also, so that it might be reached from their house under the ice, after pond and river were frozen.

Day after day Bige and I watched the progress of this harvest. Saw the beaver towing the floating logs through the canal into the pond and up the river to the lumber pile where the beaver would dive with his stick and presently come to the surface again, leaving the stick *under the water;* and we wondered how he did it. Also we discussed possible ways of making a floating stick sink. From our boat we

could see the pile of wood below the surface of the water and we could see no stones on the pile.

Bige stoutly argued in support of the theory that the beaver sucked the air out of the pores in the wood, that the water flowed into the vacuum thus produced, making the stick heavy enough to sink. In order to demonstrate his theory, Bige took the axe from camp, cut a poplar sapling an inch and a half in diameter and the usual beaver length, put one end in the water and sucked on the other end of the stick. After repeated trials and failures to make the stick do anything but float, Bige decided that his "sucker was not powerful enough." The next day, looking down into the water from our boat, we saw one end of the axe-cut stick in the wood pile with other sticks cut by beaver teeth.

After my return to the city, Bige reported from time to time, making visits to the beaver house, seeing beaver



Bige Testing the Power
of His Sucker

swimming under the ice, carrying sticks from the wood pile into the tunnel leading to the house; also later, beaver bringing peeled sticks out of the house and placing them in a very orderly manner on another pile. Reports also reached me of beaver under the ice digging pond lily roots and carrying them into the house.

In the following April after the ice in the pond had broken up, the beavers came out of their winter home and brought with them six young beaver puppies. The father beaver with the white head now went away on his summer exploration trip. We later learned that it was the habit of all male beavers to wander far from home during the summer months. The mother remained at the pond and took care of her six young ones; but with them she moved into the burrow in the bank where we had first seen the old male beaver go to hide.

Many times during the summer we

saw the young beavers sunning themselves on the bank or playing in the water near the shore. The mother was always somewhere near, and invariably sounded a warning by pounding the water with her broad tail, whereupon the youngsters would scamper for cover and each would precede his dive by slapping the water with his little ladle-like tail, in feeble imitation of the mother.

One day in June a hawk swooped down, grabbed one of the young beavers and carried him away. Later, a pekan, sometimes called a fisher, killed another one. Apparently the mother scared him off. We found the dead baby beaver, and tracks in the mud gave us the name of his murderer.

Early in July of that summer, while on a fishing trip to Wolf Pond, six miles to the east, Bige and I met our white-headed beaver friend. A slap on the water and a shower of spray informed us that we were recognized. It also

The Pekan

spoiled our fishing for at least half an hour.

Toward the end of the same month we met him at the mouth of West Bay Brook on Cedar Lake. This was nine miles west of his home and fully fifteen miles from Wolf Pond, where we last saw him.

In the third week in August we again saw our beaver with a white cap. This time on Pine Brook where he was assisting two other beavers (possibly a brother and sister of his,) in building a dam across the brook. We were fortunate in being able to conceal ourselves, and for a time watched operations. Apparently, our friend was bossing the job and directing the operations of the other two. It seemed that his ability as an engineer was recognized in beaver world, and he therefore had been called in to supervise a difficult undertaking. Thereafter we called him the Chief Engineer, and he many times proved his right to the title.

In September the Chief Engineer returned to his home at Cherry Pond, and there followed a season of great activity among the beavers. Some of their work we were privileged to see in progress, all of it we saw after completion. The young beavers were now about one third the size of their parents, but they all worked.

First, the entire family visited the outlet of the pond, where the Chief demonstrated to the others that with the rocky stream bed and the accumulated drift-wood, a dam would be unnecessary to maintain water in the pond at its present level. Next the house must be enlarged to make room for a family of six instead of two, as in the previous winter. When completed, the house was elliptical in shape, twenty-two feet across its base in the short diameter and thirty feet in its longer dimension. It was also increased in height to eight feet. The peeled sticks piled up under the ice during the pre-

A One Night Camp

vious winter were now utilized in making additions to the house with other sticks and brush brought from the woods.

The interior of the house was enlarged to more than twice its former size by cutting away and dragging out through the tunnels, surplus materials. In doing this, several pillars were left standing for supports to the enlarged ceiling.

Three additional tunnels were dug, making five channels for entrance and exit. Those terminating in shallow water were continued as ditches to deeper water.

The storage warehouse also was made larger and deeper, not only to provide mortar for enlarging the building, but because more food must be stored for six mouths than was required for two. A very high grade of what is called "instinct" in animals must be required to calculate and determine just how much food to store for a winter's supply for a family of a given size. It has been

asserted by those who think they know, that in this matter a beaver never makes a mistake. That he also stores an extra amount of food for an unusually long and severe winter. So far as I have observed, they seem to come through the winter in good physical condition.

A picture, which I have longed to secure on a film, but which, so far, I have only been able to fix on the retina of an eye, represents a young beaver about the size of a kitten, not fully grown, in an upright position, holding in his two hands and against his breast a gob of mud, while he laboriously and clumsily struggles up the steep side of his house, on the roof of which he is about to deposit his burden. In the water, towing a young log or a bushy branch, he is much more at home and more graceful in his movements.

The following spring there came out of our beaver house, the Chief Engineer, his wife, four yearlings and a new family of five babies. The "old man"

now went off on his annual exploring trip, but he took with him the four older children, while the mother and the babies remained behind. As usual, the house was deserted during the summer months. We now noted several burrows under the bank at widely separate places along shore. Sometimes the beaver would be seen entering one of these holes and again another.

It is interesting and easy, to study the habits of wild creatures, and to note how uniform are their methods and practices. It is not so easy to determine reasons for their peculiar way of doing things. It is of course permissible to speculate, but one might be expected to furnish proof, when an assertion is made. For example, it has been stated by at least two writers, that beaver desert their homes in summer so that the vermin which infest their huts may die off from starvation during the absence of their fur coated hosts.

My own guess, if I were to hazard

one, would be that since a beaver house must generally be placed in an exposed position, its owners find that with the sun beating down on its roof during June, July and August, the poorly ventilated interior becomes too hot for comfort. On the other hand, I have noted that the burrows in which they live in summer, are usually found under some overhanging tree, in a cool spot where the sun never penetrates.

During our wanderings through the woods that summer, Bige and I came upon a family of beavers at Mud Pond. These were doubtless also emigrants from the original Raquette Lake colony. Great improvements were in progress. An abandoned and broken down lumber dam at the outlet, which had not been used for lumber operations for many years, was being rebuilt by the beavers, and the Chief Engineer was on hand assisting and directing operations.

On a subsequent visit, we saw the completed dam which raised the waters

Section of Beaver Dam

of the pond about three feet. An area more than a mile long and a quarter mile wide was now flooded. A swamp at the upper end was entirely covered and afforded water transportation from a large grove of poplar trees, which without the dam could not have been reached. Five years later, on the shores of this pond, the beavers had completely cleared of trees more than ten acres of ground. At this time four beaver houses were observed on the shore and on islands in Mud Pond.

When three years old, the children of the Chief Engineer left the parental homestead, mated with relatives in other colonies and set up house building and house keeping on their own account. Some of them, doubtless, located many miles away, others we know built dams and houses on streams emptying into Cherry Pond.

One summer Bige and I were trout fishing on West Bay Brook. We worked up stream about four miles from its

Beaver Posing

mouth, and encountered seven beaver dams and as many houses. At one of these dams we found the white capped Chief working with some younger beavers. Our guess was, that some of these were his own offspring to whom he was giving instruction in engineering practice.

A year later, on Fishing Brook, twenty miles to the north-east, and fully fifty miles from the original colony on the Raquette tributary, we found several beaver colonies. They also settled on Minnow Brook. On Salmon River, from its mouth to Salmon Pond (which it drains), a distance of six miles, there is now a beaver dam every half mile. At one of these dams, a few years ago, we found the Chief Engineer at work. The dam was placed where the current was swift, and a big rock in mid stream was utilized as a pier, against which the two sections of the dam were braced. Such an adaptation of available means to accomplish a difficult engineering

Stone Pier in Beaver Dam

feat is surely something more than merely instinct.

On an exploring trip over the foot hills of Dunwood Mountain, Bige and I came upon a very unusual beaver dam on Little Bear Brook. The brook at this point flowed through a deep ravine. The dam built across the valley measured in length at its top two hundred and ten feet. It was fifteen feet from the bottom of brook to top of dam, and we estimated the width at its base at forty feet. Water was flowing over a spillway three feet wide at one end of the dam. The upper and lower sides of the dam sloped away steeply like the roof of a house, and along the ridge was a row of stones, each about the size of a man's head. We walked across the dam on these stones without wetting our feet, and we wondered how the beavers got them into position. It did not seem possible that such small animals could lift and carry these heavy stones to where they were placed. It

Beaver Dam Fifteen Feet High

was impossible for a human to roll them up over the lower and outer face of the dam, which was a network of interwoven and criss-crossed saplings, sticks and brush. The only other method which appeared to us possible was for the stones to be rolled or pushed up the upper and inner slope of the dam *under water* to the top. The inner face of the dam was of course plastered over with mud and was relatively smooth.

We cooked our eggs, bacon and tea on the bank at one end of the dam. After we had eaten and drunken and while I was engaged in taking some photographs, we were agreeably surprised to see our old friend, the bald headed Chief Engineer, swimming down the pond toward us. As a signal that we were recognized, he saluted by humping his back, lifting his broad tail and striking the water a resounding slap, thus throwing a fountain of spray high into the air. His presence signified to us that this marvelous piece of engin-

eering was the product of his skill in plan and execution.

We were able to go in a boat past the beaver house on our pond, about a mile up the river. At the head of navigation was a big flat rock, over which the water flowed, making a fall about one foot high, and above this fall were rapids. An old and much used trail started at this flat rock and led up the river; a branch also took one to Wolf Pond and another branch led to Dunwood Mountain. We often used this trail, as also did other visitors at the pond. And doubtless, so did the Indians many years ago.

A pair of young beavers, both of them probably relatives of the Chief Engineer, built a dam across the river on this flat rock. The dam was about two feet high, backing the water up the rapids thirty yards and making a fall of water over the dam three feet high. Above this dam the beavers started building a house, but before the house was com-

pleted, high water following three days of rain washed away the dam. The beavers at once rebuilt the dam in the same spot, but within a month the dam had been the second time washed away. The high water of the following spring carried the dam, rebuilt in the fall, off of the flat rock for the third time.

On the smooth flat surface of this rock there was no suitable anchorage for a dam, and the unusual pressure of high and swift flowing water pushed it down stream and scattered the materials of which it was built.

It was a bad dam-site! and this is doubtless what the Chief Engineer told the youngsters; for it was at this period that the Chief took a hand in the game.

The house that had been built above the flat rock was abandoned and was never again occupied.

A pair of beavers which we believed to be the hard luck animals above mentioned, we now found were beginning operations on a new dam about a quar-

ter of a mile down the river, and the Chief Engineer worked with them and seemed to be directing the job. We watched the progress of this enterprise for many days and found it most interesting.

At the spot selected, the river was about a hundred and twenty feet wide and five feet deep in the middle. The current was not very swift and a lot of mud had settled on the gravelly bottom. Saplings and bushy alders, many of them fifteen to twenty feet long, were used for a foundation. They were always placed with the butt ends up stream and stones on the bushy ends held them firmly anchored on the bottom. All sorts of materials were worked into this dam; much of it was carried, dragged or floated long distances. The sticks and brush were interwoven in a very ingenious manner, the chinks were filled with sod, stones and mud. The entire structure was firmly braced by heavy sticks resting against the lower

slope of the dam with one end of each stick stuck in the ground at the bottom of the river.

This dam at first was built up to two feet above the normal level of the river and water flowed over the top of the dam; but the river banks were low at this place and water also flowed over the banks—on one side into a slough and on the other side into a swamp.

The second phase of this hydro-engineering feat was now begun. It consisted of wing dams two feet high on top of the river bank and parallel to the stream. These were carried up on the north side of the river a distance of three hundred and fifty feet and on the south side about two hundred feet. The dam across the river was also made two feet higher. The dam now, in the middle of the river, was five feet high under water and four feet above the surface, making it nine feet in the highest part and with the two wings, six hundred and seventy feet long.

We had visited the scene of operations at least twice every day during the building and had casually discussed the probable difficulty in reaching the old trail up the river, but had not considered the matter seriously. One day Bige and I dragged our boat up over the dam and rowed up the river. Above the end of the wing dam the forest was flooded five hundred or more feet on each side of the river, and if we wished to follow the old trail we should have to wade through water at least as far as that; for it was impossible to push the boat through the woods, between the trees and bushes.

It was all very well and very interesting to watch the operations of the beaver, but this was carrying a joke too far. The beavers were now interfering with our business. The beavers are, of course, protected by law, but here were hundreds of fine spruce, hemlock, pine and balsam trees being drowned in our presence. The trees

would die; they were valuable; they belonged to the State and we were both of us tax-payers. This thing must be stopped at once.

We rowed back to the dam and spent three hours tearing a hole three feet wide through the middle of it. We watched the water run out through the break and then returned to camp.

The next morning we found the dam had been repaired during the night and the water was flowing over its top as usual. Two guests arrived at our camp that morning. They were interested in the story of the dam and spent all of the afternoon in making another opening to let the water out; but again the beavers had the dam repaired before the following morning. The Doctor had by now settled in his camp at the western end of the pond. He came across with his two husky boys and they broke a hole through the dam for the third time; and the third time the beavers repaired the breach during the night.

Bige Tearing Out the Dam

Bige's fighting blood was now thoroughly "het up" and he said "I'll fix them pesky beavers." A lot of men were at work building a "tote road" for a lumber camp over the other side of the mountain about three miles from our camp. Bige went over to call on them, and he came back with four sticks of dynamite and some fuse. These we connected and placed on top of the dam. We covered the dynamite with mud, lighted the fuse, jumped into our boat and rowed as fast as possible down toward the pond. When a hundred yards away, the explosion occured. With a terrific roar that beaver dam was shot toward the sky and toward every point of the compass, and the water above the dam came rushing through a gap twenty feet wide. A later examination proved, that the dam had been torn out clear to the bottom of the river. Our hand-made breaks had extended only to the surface of the water below the dam.

That night a hurry up wireless call went out, and before morning twenty-three beavers were at work rebuilding the dam, with the Chief Engineer in command. We figured that delegations must have come from a colony two miles up the river, probably some from Mud Pond, others from Pine Brook and Raquette River. Certainly, there were not, living on our pond, as many beavers as we saw at work that night. By the next morning the dam had been rebuilt to the water level, and the second morning it was completely restored with water flowing over the top. A curious fact we noted, was, that while both banks of the river were strewn with fragments of the old dam, not a single piece of this tainted and dangerous material was used. New trees and bushes were cut and carried greater distances for the rebuilding.

At this stage of the war, Bige and I surrendered. We were hopelessly outnumbered and outclassed by the beavers.

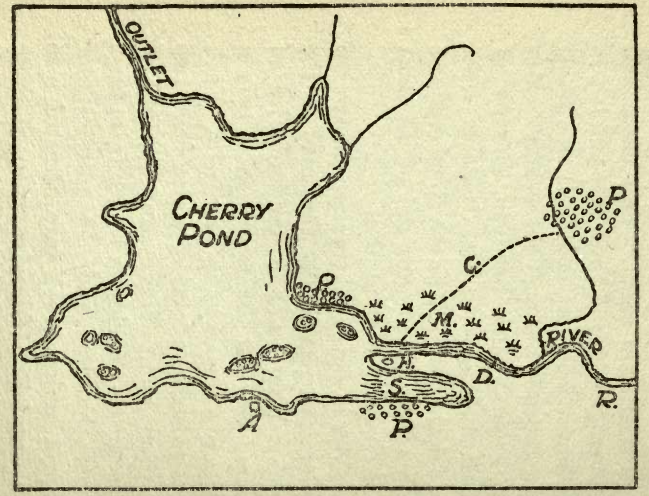
They worked while we were asleep. We now got busy and cut out a new trail around the swamp and the flooded area to connect with the old trail. This makes the walk fully a half mile longer than before the dam was built.

The Chief Engineer had lived at Cherry Pond ten years. He had brought out a new family of from four to seven individuals every spring. All of these had been housed and fed for two or three years, when they were old enough to emigrate and set up in business and housekeeping on their own. During these ten years a large quantity of bark had been consumed and poplar, the favorite food of beaver, had practically all been cut off. Along the shores and on the islands no more was to be found. It was, therefore, necessary to seek new sources of food supply.

Beyond the swamp, to the northeast of the river mouth, there was a grove of poplar trees, covering several acres. It was nearly a half mile to this grove, but

not too far for the courage of our Chief, who now set his gang of youngsters at work digging a canal. This canal had an average width of three feet and it was two and a half feet deep. It was made quite crooked through the swamp, winding around and between clumps of alders and larger trees. Smaller trees were dug up and roots which crossed the path of the canal were cut off as clean as if chopped with an axe.

Water in the canal through the swamp maintained practically the level of the pond. There was a gradual rise of ground beyond the swamp and here a series of dams or locks were built. Each dam raised the level of water from two to three feet. There were thirteen of these levels varying in length from fifty, to two hundred and fifty feet. Water from a spring brook was diverted into the canal and flowed over each dam. The beavers towed their lumber through this canal and dragged it over the several dams, each of which seemed to



A—Camp D—Dam M—Marsh R—Rapids
C—Canal H—Beaver House P—Poplar Trees S—Slough

be especially constructed to facilitate this operation. The length of this canal we estimated to be twenty-five hundred feet.

Beavers appear to prefer the bark of smaller trees, but they do not hesitate to cut down a large one when necessary. In such case they carry away the branches only. A poplar tree eighteen inches in diameter was cut on the shore of our pond and felled into the water. The branches that remained above the surface were cut off and carried to the storage pile. Those that were under water were left and were cut off under the ice during the following winter.

Beavers are generally peaceable. They have many admirable traits. Individuals of one colony will assist those of another in strenuous operations much as pioneer humans helped each other in building log cabins, in barn raisings, etc. Many tales are told. One, of a family whose house had been destroyed, being taken into another's house and

Tree 18 Inches in Diameter
Partly Cut by Beaver

the two families living together all winter. Another story relates how a mother beaver was killed, when another immediately adopted the five orphans and brought them up with her own children. We have recorded above, instances where the Chief Engineer was contributing his remarkable skill and experience toward solving the problems of his friends in widely separated parts of the forest. And we believe he did not insist upon union rules in regard to wage, hours of labor, or minimum output.

Our observations justify the belief that at least some beavers have a sense of humor. We mention two incidents in support of the theory. One day on the big lake, near the hotel, I saw two girls about twelve years of age, in a canoe. These girls were chasing a beaver. The beaver was swimming on the surface and he was more than half a mile from his house. He could easily have outdistanced the canoe and got

away from it, but he chose to swim slowly and allow the canoe to approach until the girls might have touched him with a paddle, when he would hump himself, slap the water with his tail, thus throwing showers of spray over the girls, while he dived under the canoe and presently came to the surface in some new and unexpected position. The girls, of course, with screams and excited shouts frantically swung the canoe into position and started the chase over again; while the beaver loafed along until they caught up. This game of tag, played by the girls and the beaver I watched for twenty minutes or more and each time the girls came near enough to the animal he managed to throw water on them. I feel certain that he enjoyed the game quite as much as the two girls, and while I did not hear the beaver laugh, I thought I saw a grin on his face.

The cottage where our family live during the summer, stands on a bank

about thirty feet above the water and fifty feet from the shore of the lake. A number of shade trees have been planted on the grounds about the house. Among these were two poplar trees which we had carefully nursed for five years, and they were growing fine. One of them was directly in front of the cottage and twenty feet from the steps. It was six inches in diameter. The other tree was four inches in diameter and about thirty feet from one side of the house.

A mile up the lake was a large beaver house. The shores near this house on both sides of the lake, were lined with poplar trees and an island near by was covered with them. One night a beaver from this colony came down the lake and cut down the poplar tree in front of our door, cut it into suitable lengths and towed it back up the lake to his house. In the morning all that was left where my tree stood, was a stump and some chips. The following night

The Cottage

he came again and cut the other tree. He must have made several trips to tow back to his storage pile the lumber he cut at my front door.

I have devoted some time to speculating as to the motive that might conceivably actuate a perfectly sane and intelligent beaver to haul his lumber more than a mile, when in doing so he would have to pass by hundreds of other equally good trees, many of them within a few rods of his house. The only reasonable answer I have been able to secure to this conundrum is that the beaver probably thought it would be a good joke on me; and I have a mental picture of him laughing in his sleeve as he dragged the logs down the bank in front of my door while I slept.

Early in October, a few years ago, Bige and I were entertaining three guests at our Cherry Pond camp. For two days we had been hunting with indifferent success. Awakening quite early one morning, I took my rifle and leav-

ing the other members of the party audibly sleeping on the balsam, tiptoed out of camp and down the trail. A log-road paralleled the shore of the pond and I wandered down this road, hoping to get an early morning shot at a deer. It was still quite dark and I found that the sights on my gun were still invisible in the dim light, so I sat on a log and waited for the first yellow light to appear over East Inlet Mountain. Then, continuing my silent, stalking way, when opposite the mouth of the river, I heard curious and unusual sounds. Peering through the bushes across the slough I saw a black bear. He was on top of the beaver house and with his claws was tearing out sticks, brush and sod and throwing them in every direction. The bear was very busy and with great energy and determination he was proceeding to dig out the Chief Engineer. Of course I knew that the Chief was in no personal danger, as he had a perfectly safe way of retreat

Bear Wrecking Beaver House

open, under water. But I could not stand idly by and see his roof torn off: so I took careful aim and fired. The bear tumbled down the steep slope of the beaver house and I had visions of bear steak, etc., etc. But he immediately got on his feet and wallowed through the slough to the shore. As he crossed the log-road headed toward the woods I fired again and the second time the bear fell. It did not take him long to recover his balance and start at high speed up the steep hillside. About ten rods from where I stood, the bear came into an opening in the bushes which had once been a skid-way for logs; here he stopped, put his fore paws up on a log and looked back at me. "Now," I said, to the trees and bushes, "he's coming back to argue with me." Before he started, however, the third shot cut a bunch of hair off of his shoulder and he resumed his journey up the mountain and I went back to camp.

The racket made by three shots in

the early morning had suddenly interrupted the camp chorus, and I was greeted with the inquiry, "Where's the deer?"

"That deer," said I, "is a bear, and he's big as a horse. I left him up in the woods. We'll go and get him after breakfast."

Bige allowed that "if it really was a bear, he wasn't hurt much. You couldn't kill a bear with that pop-gun. (I was using a Winchester 30). Why, a bear's hide is thicker than sole-leather and this time of year he has an armor-plate of fat under it, six inches thick. You might as well try to shoot a hole through a feather pillow. If you are going to hunt bear, take an elephant-gun—a 45-90."

After breakfast, we all started out on the trail of the bear. We found blood spots in the log-road. We also measured a foot print in a soft place in the path. It was twelve inches in diameter. Broken bushes, blood spots on fallen

trees and on leaves marked his route up the steep slope. Half way up the mountain on a big ledge of rocks, covered with moss, the bear had been lying down. A pool of blood marked the spot. Also, numerous tufts of moss torn from the rock and saturated with blood were scattered about. Apparently the bear had pulled up handfuls of the soft moss and used it in the same manner that a surgeon uses lint.

Bige suggested, "This is a first aid station for bears; but if you should tell anyone what you have seen here, you will be put in the class of Nature Fakirs."

We followed the bear's trail from the mossy rock up to the top of the mountain and had started down the other side when it began to rain. In a few minutes the rain had washed away the red stains and we lost the trail and returned to camp. But that bear is going yet. Also, he is carrying with him three bullets that belong to me. Some day, somewhere in the woods, I expect

to meet him again, when I shall take those bullets away from him.

It is now seventeen years since we first met the Chief Engineer. He still retains the monopoly of his trade mark. Within our knowledge, no other beaver has appeared with a white spot on his head. But the Chief shows his age. His brown coat of fur looks faded and grey, and the white spot is less conspicuous. The Chief was a member of the first colony installed for the purpose of restocking the northern forests; and he has contributed his share, both to increasing the inhabitants and to rebuilding beaver industries. Every season a new family of four to seven beavers have been sent out from his home to start other families, and so they have multiplied in a sort of geometrical progression until now they cover many hundreds of square miles of forest land and water. Early in 1920 the Conservation Commissioner of the State of New York estimated that there were

more than twenty thousand beavers in the Adirondack region. My guess is that this estimate is much too low.

One day last summer, Bige and I saw the Chief Engineer dive and enter a tunnel leading to his house. We silently paddled up close to the house and listened. Presently we heard a murmur of beaver conversation inside. "Gosh!" said Bige, "the old Chief is giving instructions to the kid beavers. He's telling 'em how to handle the job they have to do tonight."

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